CHAPTER 3

GENERAL OPERATIONS AND PROCEDURES OF THE NATIONAL WEATHER SERVICE HURRICANE CENTERS

3.1. General. This chapter describes the products, procedures, and communications headers used by the Tropical Prediction Center/National Hurricane Center (TPC/NHC) and the Central Pacific Hurricane Center (CPHC). See Appendix A for a description of local National Weather Service (NWS) office products which support the tropical cyclone forecast and warning program.

3.2. Products.

- **3.2.1. Tropical Weather Outlook (TWO).** Tropical weather outlooks are prepared and issued by the TPC/NHC and CPHC during their respective hurricane seasons. The TPC/NHC writes TWOs for both the Atlantic and Eastern Pacific Basins. They are transmitted at 0530, 1130, 1730, and 2230 Eastern Local Time in the Atlantic and at 0400, 1000, 1600, and 2200 Pacific Local Time. In the Central Pacific, TWOs are transmitted by the CPHC at 0200, 0800, 1400, and 2000 UTC. The outlook briefly describes significant areas of disturbed weather and their potential for tropical cyclone development out to 48 hours. A tropical weather summary of Atlantic, Eastern Pacific, and Central Pacific tropical cyclone activity will be prepared and issued at the end of each month during the hurricane season.
- **3.2.2. Tropical Cyclone Discussion.** The TPC/NHC and the CPHC will, as appropriate, issue tropical cyclone discussions on Atlantic, Eastern Pacific, and Central Pacific tropical cyclones at 0300, 0900, 1500, and 2100 UTC. Discussions will contain preliminary prognostic positions and maximum wind-speed forecasts up to 72 hours; will describe objective techniques, synoptic features, and climatology used; and will provide reasons for track changes.
- 3.2.3. Tropical Cyclone Public Advisories. Tropical cyclone public advisories are issued by the TPC/NHC for all tropical cyclones in the Atlantic. In the Eastern Pacific, tropical cyclone public advisories are issued by TPC/NHC for tropical cyclones that are expected to affect land within 48 hours. In the Central Pacific, tropical cyclone public advisories are issued by CPHC for all tropical cyclones within the area of responsibility. Tropical cyclone public advisories are issued at the same time scheduled tropical cyclone forecast/advisories are issued; *i.e.*, 0300, 0900, 1500, and 2100 UTC. Watch and warning break points are listed in Appendix B. In the Western Pacific, public advisories are issued by the NWS Forecast Office (WFO), Tiyan, Guam, for all tropical cyclones within the Territory of Guam and Micronesia, using tropical cyclone forecasts/advisories prepared by the Joint Typhoon Warning Center (JTWC) as guidance.

[NOTE: To further publicize local products, when a tropical cyclone threatens a land area, the following statement shall be included in the advisory..."For storm information specific to your area...please monitor products issued by your local weather office." Tropical cyclone public advisories use statute miles for distance and miles per hour for speed. Nautical miles and knots may be added at the discretion of the centers. Atlantic advisories should include the metric units in kilometers and kilometers per hour following the equivalent English units except when the United States is the only country threatened.]

3.2.4. Tropical Cyclone Forecast/Advisories. Tropical cyclone forecast/advisories are issued by the TPC/NHC and the CPHC. See Section 4.3 for content and format of the advisories. In both the Atlantic and Pacific, the advisories are scheduled for 0300, 0900, 1500, and 2100 UTC. Pacific advisories should be transmitted 15 minutes before the effective time. In the Western Pacific, tropical cyclone forecasts/advisories are issued by the JTWC; Appendix C provides a listing of the abbreviated communications headings and titles for JTWC products. Information on the broadcast of tropical cyclone information to coastal and high-seas shipping can be found in Chapter 9, Marine Weather Broadcasts.

3.2.5. Probability of Hurricane/Tropical Storm Conditions.

3.2.5.1. When Issued. The probability of hurricane/tropical storm conditions shall be issued in tabular form at regularly scheduled tropical cyclone public advisory and tropical cyclone forecast/advisory times. These probabilities will generally be carried for all named storms in the Atlantic Basin¹ within 72 hours of forecasted landfall. In addition, TPC/NHC may issue probabilities for tropical depressions forecast to become named storms and be a threat to land within 72 hours. When a tropical cyclone is forecast to track parallel to a coastline, maximum values over water points should be included, and the tropical cyclone public advisory should state that the highest probabilities are over water. The 72-hour cumulative probabilities of less than 5 percent are not included in the transmitted probability tables.

3.2.5.2. When Computed. The probabilities, which are based on the official forecast track, should be issued when the 72-hour forecast position approaches the coast and should be carried in advisories until the storm makes landfall. Two conditions in which probability information should not be issued are: (1) the hurricane/tropical storm has made landfall and is not expected to reemerge over water and/or (2) the computed probability values are not significant. At the discretion of the hurricane forecaster, probabilities need not be listed for sites where the tropical storm or hurricane would likely be over land or less than tropical storm strength at the time it would affect the site. TPC/NHC may include a brief explanation of probabilities in the advisory.

These probabilities should be computed shortly after synoptic times for the 0-24, 24-36, 36-48, and 48-72 hours. A total probability for the next 72 hours should be shown in the last column and should represent a total of all forecast periods. The probability of the storm striking a coastal location within 48 hours may be determined by adding the 0-24, 24-36, and 36-48 hour probabilities. If the probability for a location is less than 1 percent, an "X" will be indicated in the table. If probabilities are not to be issued, a statement will be included in both the tropical cyclone public advisory and the tropical cyclone forecast/advisory. Refer to *Probability of Hurricane/Tropical Storm Conditions: A User's Manual* for further information.

¹ Atlantic Basin includes the Atlantic, Caribbean, and Gulf of Mexico

3.2.5.3. Locations. When appropriate, specific probabilities will be computed for the following locations:

Brownsville, TX Fort Pierce, FL Corpus Christi, TX Cocoa Beach, FL Port O'Connor, TX Daytona Beach, FL Galveston, TX Jacksonville, FL Port Arthur, TX Savannah, GA New Iberia, LA Charleston, SC Myrtle Beach, SC New Orleans, LA Buras, LA Wilmington, NC Gulfport, MS Morehead City, NC Mobile, AL Cape Hatteras, NC Pensacola, FL Norfolk, VA Panama City, FL Ocean City, MD Apalachicola, FL Atlantic City, NJ St. Marks, FL New York City, NY Cedar Key, FL Montauk Point, NY Providence, RI Tampa, FL Venice, FL Nantucket Island, MA Fort Myers, FL Hyannis, MA Marco Island, FL Boston, MA Key West, FL Portland, ME Bar Harbor, ME Marathon, FL Miami, FL Eastport, ME

West Palm Beach, FL 28N 93W 29N 85W 28N 95W 27N 96W 28N 89W 25N 96W 28N 91W

Note: Probabilities are not issued for the west coast of the continental United States, Hawaii, and the Territory of Guam and Micronesia.

3.2.6. Tropical Cyclone Updates. Tropical cyclone updates are brief statements in lieu of or preceding special forecasts to inform of significant changes in a tropical cyclone, or to post or cancel watches and warnings.

- **3.2.7. Tropical Cyclone Position Estimates**. The hurricane centers and WFO Guam may issue a position estimate between 2-hourly intermediate public advisories whenever sufficient, reliable radar center fix information is available. Position estimates disseminated to the public, DOD, and other Federal agencies will provide geographical positions in two ways: by latitude and longitude and by distance and direction from a well-known point.
- **3.2.8. Special Tropical Disturbance Statement.** Special tropical disturbance statements may be issued to furnish information on strong formative, non-depression systems.
- 3.2.9. HPC Public Advisories (TCP). The National Centers for Environmental Prediction's Hydrological Prediction Center (HPC) will issue public advisories after subtropical and named tropical cyclones have moved inland, NHC advisories have been discontinued and the storm system remains a threat to inland areas primarily due to heavy rain and flash flooding. Advisories will not be issued for storms entering the coast of Mexico not posing an immediate flash flood threat to the conterminous United States. Advisories are issued at 0300, 0900, 1500, and 2100 UTC. They will continue to be numbered in sequence with tropical cyclone advisories and will reference the former storm's name in the text. Content will refer to the decaying system's position, intensity, general forecast trends, highlight impacts which occurred and are expected to occur (usually in relation to heavy rain/flooding and tornadoes), and indicate when the next summary will be issued. Advisories will terminate when the threat of flash flooding has ended or when the remnants of these storms can no longer be distinguished from other synoptic features capable of producing flash floods.
- **3.2.10. Tropical Disturbance Rainfall Estimates.** As required, the TPC/NHC/CPHC will issue satellite-based rainfall estimates for tropical disturbances and tropical cyclones within 36 hours of forecasted landfall.
- **3.2.11. Tropical Weather Summary (Monthly).** NHC and CPHC will prepare and issue these products each month during the hurricane season. The product will summarize the previous month's tropical cyclone activity. The last product issued at the end of the hurricane season will summarize November's activity plus the activity for the whole season.
- **3.2.12. Tropical Cyclone Summary Fixes.** CPHC will issue these products when a tropical cyclone is classifiable using the Dvorak technique. Fixes will be issued for the north central Pacific from 140EW to 180E and for the south central Pacific from 120EW to 160EE. After the initial tropical cyclone fix, succeeding fixes will be done at approximately 0000, 0600, 1200, and 1800 UTC as long as the system is classifiable using the Dvorak technique.

3.3. Designation of Tropical and Subtropical Cyclones.

3.3.1. Numbering of Tropical and Subtropical Depressions. The hurricane centers are responsible for numbering tropical and subtropical depressions in their areas of responsibility. Tropical depressions shall be numbered consecutively beginning each season with the spelled out number "ONE." For ease in differentiation, tropical depression numbers shall include the suffix "E" for Eastern Pacific, "C" for Central Pacific, or "W" for Western Pacific, after the number. In both the Atlantic and Pacific, once the depression has reached tropical storm intensity, it shall be named and the depression number dropped. The depression number will not be used again until the following year. Give tropical cyclones a name in the first advisory after intensifying to 34 knots (39 mph) or greater.

The following rules apply for tropical cyclones passing from one basin to another: Retain the name if a tropical cyclone passes from one basin into another basin as a tropical cyclone; i.e, advisories are continuous. An unnamed tropical depression will also retain its number (e.g. Tropical Depression Six-E remains Tropical Depression Six-E) if it crosses into another area of responsibility. For unnamed tropical depressions moving from west to east across 180E, CPHC will use the same number as previously assigned by the Region Specialized Meteorological Center (RSMC) Tokyo. Additionally, CPHC will provide the associated JTWC number, if different, in parentheses.

Within a basin, if the remnant of a tropical cyclone redevelops into a tropical cyclone, it is assigned its original number or name. If the remnants of a former tropical cyclone regenerate in a new basin, the regenerated tropical cyclone will be given a new designation.

- **3.3.1.1. Atlantic Basin.** Depression numbers, ONE, TWO, THREE, will be assigned by the TPC/NHC after advising the Naval Atlantic Meteorology and Oceanography Center (NAVLANTMETOCCEN) Norfolk.
- **3.3.1.2. Pacific East of 140EW.** Depression numbers, with the suffix E, e.g., ONE-E, TWO-E, THREE-E, will be assigned by the TPC/NHC after advising JTWC, Pearl Harbor, HI. The assigned identifier shall be retained even if the depression passes into another warning area.
- **3.3.1.3.** Pacific West of 140EW and East of 180E. Depression numbers, with suffix C; e.g., ONE-C, TWO-C, THREE-C, will be assigned by the CPHC after advising JTWC.
- **3.3.1.4.** Pacific West of 180E and North of 0E. Depression numbers, with suffix W; e.g., ONE-W, TWO-W, THREE-W, are assigned by JTWC.
- **3.3.1.5. Subtropical Depressions.** A single list of numbers and names will be used for all tropical and subtropical cyclones. Therefore, numbering of subtropical depressions will follow the same procedure as tropical depressions. For example, if the first subtropical depression follows the first tropical depression, the subtropical depression will be given the designation SUBTROPICAL DEPRESSION TWO. If a subtropical depression becomes a subtropical storm, it receives the next available name in the tropical cyclone naming sequence.

3.3.2. Naming of Tropical and Subtropical Storms and Hurricanes.

- **3.3.2.1. Atlantic and Eastern Pacific.** Once the depression has reached tropical storm strength, it shall be named and the depression number will be dropped. If a subtropical cyclone becomes a tropical storm or hurricane, it receives the next available <u>name</u> in the tropical storm naming sequence. A different set of names will be used each year. After a set is used, it will drop to the end of the list to be used again in 6 years. Names of significant hurricanes will be retired and replaced. Lists of Atlantic and Eastern Pacific names are provided in Tables 3-2 and 3-3, respectively.
- **3.3.2.2. Central Pacific.** When a tropical depression intensifies into a tropical storm or hurricane between 140EW and 180E, the depression number will be discontinued and replaced by an appropriate name. The CPHC will select the name from the list of Central Pacific names in Table 3-4. All of the names listed in each column, beginning with column 1, will be used before going on to the next column.
- **3.3.2.3. Western Pacific.** For the Pacific west of 180E, the names of tropical storms and typhoons are assigned by RSMC Tokyo. The names listed in Table 3-5 (International Tropical Cyclone Names for the Western Pacific and South China Sea) are for information only. The meaning of each name, its phonetic pronunciation, and, in most instances, the name pronounced by a native speaker is available on the Hong Kong Observatory web site: www.weather.gov.hk/informtc/sound/tcname2000e.htm. A special program is required to hear the names pronounced by a native speaker; those names appear in blue. The program is available for downloading from the web site.

3.4. Transfer of Warning Responsibility.

- **3.4.1. TPC/NHC to CPHC.** When a tropical or subtropical cyclone approaches 140EW, the coordinated transfer of warning responsibility from TPC/NHC to CPHC will be made and the appropriate advisory issued.
- **3.4.2. CPHC to JTWC/(RSMC, Tokyo).** When a tropical or subtropical cyclone crosses 180Efrom east to west, the coordinated transfer of warning responsibility from CPHC to JTWC will be made and the appropriate advisory issued. At the same time, the CPHC will coordinate with the RSMC, Tokyo so that they are aware that CPHC will be suspending the issuance of advisories.
- **3.4.3. JTWC/(RSMC, Tokyo) to CPHC.** When a tropical or subtropical cyclone crosses 180E from west to east, the coordinated transfer of warning responsibility from JTWC to CPHC will be made. JTWC will append the statement, "Next advisory by CPHC-HNL" to their last advisory. At the same time, the CPHC will coordinate with RSMC, Tokyo so that they are aware that CPHC will be assuming the issuance of advisories.

Table 3-1. Atlantic Tropical Cyclone Names

2002		2003		2004	
ARTHUR BERTHA CRISTOBAL	BUR-tha CRIS-to-ball	ANA BILL CLAUDETTE	claw-DET	ALEX BONNIE CHARLEY	
DOLLY EDOUARD FAY	eh-DWARD	DANNY ERIKA FABIAN	ERR-ree-ka FAY-bee-in	DANIELLE EARL FRANCES	dan-YELL
GUSTAV HANNA ISIDORE	GOO-stahv IS-i-door	GRACE HENRI ISABEL	ahn-REE IS-a-bell	GASTON HERMINE IVAN	GAS-tone her-MEEN eye-van
JOSEPHINE KYLE	JO-ze-feen	JUAN KATE	WAN	JEANNE KARL	JEEN
LILI MARCO NANA	LIL-ee NAN-uh	LARRY MINDY NICHOLAS	NIK-o-las	LISA MATTHEW NICOLE	LEE-sa ni-COLE
OMAR PALOMA	pa-LOW-ma	ODETTE PETER	o-DET	OTTO PAULA	
RENE SALLY TEDDY	re-NAY	ROSE SAM TERESA	te-REE-sa	RICHARD SHARY TOMAS	RICH-erd SHA-ree to-MAS
VICKY WILFRED		VICTOR WANDA	VIC-ter	VIRGINIE WALTER	vir-JIN-ee
2005		2006		2007	
ARLENE BRET		ALBERTO BERYL	al-BAIR-to BER-ril	<i>Andrea</i> BARRY	
CINDY DENNIS EMILY		CHRIS DEBBY ERNESTO	er-NES-toe	CHANTAL DEAN ERIN	shan-TAHL AIR-in
FRANKLIN GERT		FLORENCE GORDON	er-ines-ide	FELIX GABRIELLE	FEEL-ix gay-bree-EL
HARVEY IRENE JOSE	ho-ZAY	HELENE ISAAC JOYCE	he-LEEN EYE-sak	HUMBERTO Ingrid	oom-BAIR-to
KATRINA LEE	ka-TREE-na	KIRK LESLIE		JERRY KAREN LORENZO	
MARIA NATE OPHELIA	ma-REEH-ah o-FEEL-ya	MICHAEL NADINE OSCAR	MIKE-el nay-DEEN	<i>Melissa</i> NOEL OLGA	
PHILIPPE RITA	fe-LEEP	PATTY RAFAEL	ra-fa-EL	PABLO REBEKAH	PA-blow
STAN TAMMY VINCE WILMA		SANDY TONY VALERIE WILLIAM		SEBASTIEN TANYA VAN WENDY	say-BAS-tyan TAHN-ya

If over 21 tropical cyclones occur in a year, the Greek alphabet will be used following the Wnamed cyclone. *Andrea replaces the retired name of Allison; Ingrid replaces Iris; and Melissa replaces Michelle in 2007.*

Table 3-2. Eastern Pacific Tropical Cyclone Names

2002 ALMA BORIS CRISTINA DOUGLAS	AL mah	2003 ANDRES BLANCA CARLOS DOLORES	ahn DRASE BLAHN kah	2004 AGATHA BLAS CELIA DARBY	
ELIDA FAUSTO GENEVIEVE HERNAN	ELL ee dah FOW sto her NAHN	ENRIQUE FELICIA GUILLERMO HILDA	anh REE kay fa LEE sha gee YER mo	ESTELLE FRANK GEORGETTE HOWARD	
ISELLE JULIO KENNA LOWELL MARIE NORBERT	ee SELL HOO lee o	IGNACIO JIMENA KEVIN LINDA MARTY NORA	eeg NAH cio he MAY na	ISIS JAVIER KAY LESTER MADELINE NEWTON	EYE sis ha VEE AIR
ODILE POLO RACHEL SIMON TRUDY VANCE WINNIE	oh DEAL	OLAF PATRICIA RICK SANDRA TERRY VIVIAN WALDO	OH lahf	ORLENE PAINE ROSLYN SEYMOUR TINA VIRGIL WINIFRED	or LEAN
XAVIER	ZAY vier	XINA	ZEE nah	XAVIER	ZAY vier
YOLANDA ZEKE	yo LAHN da	YORK ZELDA	ZEL dah	YOLANDA ZEKE	yo LAHN da
<u>2005</u>		<u>2006</u>		<u>2007</u>	
ADRIAN	DEE a tui-	ALETTA	ah LET ah	ALVIN	
BEATRIZ CALVIN	BEE a triz	BUD CARLOTTA		BARBARA COSME	COS may
DORA		DANIEL		DALILA	,
EUGENE		D, 1.LL			
	C NIANI I I	EMILIA	ee MILL ya	ERICK	
FERNANDA GREG	fer NAN dah	EMILIA FABIO	FAH bee o	FLOSSIE	
FERNANDA GREG HILARY	fer NAN dah	EMILIA	•		hen ree ETT
GREG HILARY IRWIN		EMILIA FABIO GILMA HECTOR ILEANA	FAH bee o	FLOSSIE GIL HENRIETTE ISRAEL	hen ree ETT
GREG HILARY IRWIN JOVA	fer NAN dah HO vah	EMILIA FABIO GILMA HECTOR ILEANA JOHN	FAH bee o GIL mah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE	
GREG HILARY IRWIN JOVA KENNETH		EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY	FAH bee o GIL mah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO	KEE ko
GREG HILARY IRWIN JOVA		EMILIA FABIO GILMA HECTOR ILEANA JOHN	FAH bee o GIL mah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE	
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA		EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN	FAH bee o GIL mah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA	KEE ko Iow RAY na mahn WELL
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA OTIS		EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN OLIVIA	FAH bee o GIL mah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA OCTAVE	KEE ko low RAY na
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA OTIS PILAR	HO vah	EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN OLIVIA PAUL	FAH bee o GIL mah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA OCTAVE PRISCILLA	KEE ko Iow RAY na mahn WELL
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA OTIS		EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN OLIVIA PAUL ROSA	FAH bee o GIL mah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA OCTAVE	KEE ko low RAY na mahn WELL AHK tave
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA OTIS PILAR RAMON SELMA TODD	HO vah	EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN OLIVIA PAUL ROSA SERGIO TARA	FAH bee o GIL mah ill ay AH nah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA OCTAVE PRISCILLA RAYMOND SONIA TICO	KEE ko Iow RAY na mahn WELL
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA OTIS PILAR RAMON SELMA TODD VERONICA	HO vah	EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN OLIVIA PAUL ROSA SERGIO TARA VICENTE	FAH bee o GIL mah ill ay AH nah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA OCTAVE PRISCILLA RAYMOND SONIA TICO VELMA	KEE ko low RAY na mahn WELL AHK tave
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA OTIS PILAR RAMON SELMA TODD VERONICA WILEY	HO vah	EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN OLIVIA PAUL ROSA SERGIO TARA VICENTE WILLA	FAH bee o GIL mah ill ay AH nah SIR gee oh vee CEN tay	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA OCTAVE PRISCILLA RAYMOND SONIA TICO VELMA WALLIS	KEE ko low RAY na mahn WELL AHK tave SONE yah TEE koh
GREG HILARY IRWIN JOVA KENNETH LIDIA MAX NORMA OTIS PILAR RAMON SELMA TODD VERONICA	HO vah	EMILIA FABIO GILMA HECTOR ILEANA JOHN KRISTY LANE MIRIAM NORMAN OLIVIA PAUL ROSA SERGIO TARA VICENTE	FAH bee o GIL mah ill ay AH nah	FLOSSIE GIL HENRIETTE ISRAEL JULIETTE KIKO LORENA MANUEL NARDA OCTAVE PRISCILLA RAYMOND SONIA TICO VELMA	KEE ko low RAY na mahn WELL AHK tave

If over 24 tropical cyclones occur in a year, the Greek alphabet will be used following ZEKE or ZELDA. *Alviin replaces the retired name of Aldoph.*

Table 3-3. Central Pacific Tropical Cyclone Names

CO	LUMN 1	CC	DLUMN 2
Name	Pronunciation	Name	Pronunciation
AKONI	ah-KOH-nee	AKA	AH-kah
EMA	EH-mah	EKEKA	eh-KEH-kak
HANA	HAH-nah	HALI	HAH-lee
IO	EE-oo	IOLANA	ee-OH-lah-nah
KELI	KEH-lee	KEONI	keh-ON-nee
LALA	LAH-lah	LI	LEE
MOKE	MOH-keh	MELE	MEH-leh
NELE	NEH-leh	NONA	NOH-nah
OKA	OH-kah	OLIWA	oh-LEE-vah
PEKE	PEH-keh	PAKA	PAH-kah
ULEKI	oo-LEH-kee	UPANA	oo-PAH-nah
WILA	VEE-lah	WENE	WEH-neh
	COLUMN 3	CC	DLUMN 4
Name	COLUMN 3 Pronunciation	CO Name	DLUMN 4 Pronunciation
Name	Pronunciation	Name	Pronunciation
Name ALIKA	Pronunciation ah-LEE-kah	Name ANA	Pronunciation AH-nah
Name ALIKA ELE	Pronunciation ah-LEE-kah EH-leh	Name ANA ELA	Pronunciation AH-nah EH-lah
Name ALIKA ELE HUKO	Pronunciation ah-LEE-kah EH-leh HOO-koh	Name ANA ELA HALOLA	Pronunciation AH-nah EH-lah hah-LOH-lah
Name ALIKA ELE HUKO IOKE	Pronunciation ah-LEE-kah EH-leh HOO-koh ee-OH-keh	Name ANA ELA HALOLA IUNE	Pronunciation AH-nah EH-lah hah-LOH-lah ee-OO-neh
Name ALIKA ELE HUKO IOKE KIKA	Pronunciation ah-LEE-kah EH-leh HOO-koh ee-OH-keh KEE-kah	Name ANA ELA HALOLA IUNE KIMO	Pronunciation AH-nah EH-lah hah-LOH-lah ee-OO-neh KEE-moh
Name ALIKA ELE HUKO IOKE KIKA LANA	Pronunciation ah-LEE-kah EH-leh HOO-koh ee-OH-keh KEE-kah LAH-nah	Name ANA ELA HALOLA IUNE KIMO LOKE	Pronunciation AH-nah EH-lah hah-LOH-lah ee-OO-neh KEE-moh LOH-keh
Name ALIKA ELE HUKO IOKE KIKA LANA MAKA	Pronunciation ah-LEE-kah EH-leh HOO-koh ee-OH-keh KEE-kah LAH-nah MAH-kah	Name ANA ELA HALOLA IUNE KIMO LOKE MALIA	Pronunciation AH-nah EH-lah hah-LOH-lah ee-OO-neh KEE-moh LOH-keh mah-LEE-ah
Name ALIKA ELE HUKO IOKE KIKA LANA MAKA NEKI	Pronunciation ah-LEE-kah EH-leh HOO-koh ee-OH-keh KEE-kah LAH-nah MAH-kah NEH-kee	Name ANA ELA HALOLA IUNE KIMO LOKE MALIA NIALA	Pronunciation AH-nah EH-lah hah-LOH-lah ee-OO-neh KEE-moh LOH-keh mah-LEE-ah nee-AH-lah
Name ALIKA ELE HUKO IOKE KIKA LANA MAKA NEKI OLEKA	Pronunciation ah-LEE-kah EH-leh HOO-koh ee-OH-keh KEE-kah LAH-nah MAH-kah NEH-kee oh-LEH-kah	Name ANA ELA HALOLA IUNE KIMO LOKE MALIA NIALA OKO	Pronunciation AH-nah EH-lah hah-LOH-lah ee-OO-neh KEE-moh LOH-keh mah-LEE-ah nee-AH-lah OH-koh

NOTE: Use Column 1 list of names until exhausted before going to Column 2, etc. All letters in the Hawaiian language are pronounced, including double or triple vowels.

Table 3-4. International Tropical Cyclone Names for the Western Pacific and South China Sea

	I	II	III	IV	V
Contributor	NAME	NAME	NAME	NAME	NAME
Cambodia	Damrey	Kong-rey	Nakri	Krovanh	Sarika
China	Longwang	Yutu	Fengshen	Dujuan	Haima
DPR Korea	Kirogi	Toraji	Kalmaegi	Maemi	Meari
HK, China	Kai-tak	Man-yi	Fung-wong	Choi-wan	Ma-on
Japan	Tembin	Usagi	Kammuri	Koppu	Tokage
Lao PDR	Bolaven	Pabuk	Phanfone	Ketsana	Nock-ten
Macau	Chanchu	Wutip	Vongfong	Parma	Muifa
Malaysia	Jelawat	Sepat	Rusa	Melor	Merbok
Micronesia	Ewiniar	Fitow	Sinlaku	Nepartak	Nanmadol
Philippines	Bilis	Danas	Hagupit	Lupit	Talas
RO Korea	Kaemi	Nari	Changmi	Sudal	Noru
Thailand	Prapiroon	Wipha	Mekkhala	Nida	Kulap
U.S.A.	Maria	Francisco	Higos	Omais	Roke
Viet Nam	Saomai	Lekima	Bavi	Conson	Sonca
Cambodia	Bopha	Krosa	Maysak	Chanthu	Nesat
China	Wukong	Haiyan	Haishen	Dianmu	Haitang
DPR Korea	Sonamu	Podul	Pongsona	Mindulle	Nalgae
HK, China	Shanshan	Lingling	Yanyan	Tingting	Banyan
Japan	Yagi	Kajiki	Kujira	Kompasu	Washi
Lao PDR	Xangsane	Faxai	Chan-hom	Namtheun	Matsa
Macau	Bebinca	Vamei	Linfa	Malou	Sanvu
Malaysia	Rumbia	Tapah	Nangka	Meranti	Mawar
Micronesia	Soulik	Mitag	Soudelor	Rananim	Guchol
Philippines	Cimaron	Hagibis	Imbudo	Malakas	Talim
RO Korea	Chebi	Noguri	Koni	Megi	Nabi
Thailand	Durian	Ramasun	Morakot	Chaba	Khanun
U.S.A.	Utor	Chataan	Etau	Aere	Vicente
Viet Nam	Trami	Halong	Vamco	Songda	Saola

NOTE: The official international name list was effective January 1, 2000. Names will be assigned in rotation starting with Damrey for the first tropical cyclone of the year 2000 which is of tropical storm strength or greater. When the last name in column 5 (Saola) is used, the sequence will begin again with the first name in column 1 (Damrey).

3.5. Alternate Warning Responsibilities.

3.5.1. Transfer to Alternate. In the event of impending or actual operational failure of a hurricane forecast center, tropical warning responsibilities will be transferred to an alternate facility in accordance with existing directives and retained there until resumption of responsibility can be made. Alternate facilities are as follows:

<u>PRIMARY</u>	<u>ALTERNATE</u>
TPC/NHC	National Centers for Environmental Prediction Hydrometeorological Prediction Center (HPC) Camp Springs, MD
СРНС	TPC/NHC
CARCAH	53rd Weather Reconnaissance Squadron (53 WRS)
JTWC	Fleet Numerical Meteorology and Oceanography Center (FLENUMETOCCEN), Monterey, CA
NWSO Tiyan, Guam	СРНС

- **3.5.2. Notification**. The NAVLANTMETOCCEN, Norfolk, and JTWC, Pearl Harbor, will be advised by TPC/NHC, CARCAH, and CPHC, as appropriate, of impending or actual transfer of responsibility by the most rapid means available. JTWC will advise CPHC and TPC/NHC of impending or actual transfer of JTWC responsibilities. In the event of an operational failure of CARCAH, direct communication is authorized between the 53 WRS and the forecast facility. Contact 53 WRS at DSN 597-2409/COM 601-377-2409 or through the Keesler AFB Command Post at DSN 597-4330/COM 601-377-4330 (ask for the 53 WRS).
- **3.6.** Abbreviated Communications Headings. Abbreviated communications headings are assigned to advisories on tropical and subtropical cyclones and other advisories based on depression numbers or storm name and standard communications procedures.

[NOTE: An abbreviated heading consists of three groups with ONE space between each of the groups. The first group contains a data type indicator (e.g., WT for hurricane), a geographical indicator (e.g. NT for Atlantic Basin), and a number. The second group contains a location identifier of the message originator (e.g., KNHC for TPC/NHC). The third group is a date-time group in UTC. An example of a complete header is: WTNT31 KNHC 180400.]

Abbreviated communications headers for the areas of responsibility follow:

3.6.1. Atlantic (see paragraph 3.6.3 also).

ABNT20 KNHC	Tropical Weather Outlook
ABNT30 KNHC	Tropical Weather Summary (monthly)
WTNT61 KNHC	Tropical Cyclone Update
WTNT51 KNHC	Tropical Cyclone Position Estimate
WONT41 KNHC	Special Tropical Disturbance Statement
FXUS01 KWBC	1-2 Day Discussion
FXUS02 KWBC	3-7 Day Discussion
FXUS04 KWBC	Precipitation Discussion

3.6.2. Pacific (see paragraph 3.6.3 also).

ABPZ20 KNHC	Tropical Weather Outlook (Eastern Pacific)
ABPZ30 KNHC	Tropical Weather Summary (monthly)
ACPN50 PHFO	Tropical Weather Outlook (Central Pacific)
ACPN60 PHFO	Tropical Weather Summary (monthly)
TXPN40 PHFO	Northern Hemisphere Tropical Cyclone Summary (Fixes)
TXPS40 PHFO	Southern Hemisphere Tropical Cyclone Summary (Fixes)
WTPZ51 KNHC	Tropical Cyclone Position Estimate (Eastern Pacific)
WTPA50 PHFO	Tropical Cyclone Position Estimate (Central Pacific)
WTPZ61 KNHC	Tropical Cyclone Update (Eastern Pacific)
WTPA60 PHFO	Tropical Cyclone Update (Central Pacific)
WOPZ41 KNHC	Special Tropical Disturbance Statement (Eastern Pacific)
ACPA80 PHFO	Special Tropical Disturbance Statement (Central Pacific)

3.6.3. Numbering. Depressions are numbered internally and storms are named internally, but the number in the abbreviated headings does not relate to either the internal number of the depression or the name of the storm. The first cyclone would have 21 and 31 in the abbreviated headings, the second cyclone would have 22 and 32, the sixth cyclone would have 21 and 31, etc. The abbreviated heading would not change when a depression was upgraded to storm status.

WTNT21-25 KNHC	Tropical Cyclone Forecast/Advisory (Atlantic)
WTNT31-35 KWNH	HPC Public Advisory (Atlantic)
WTNT41-45 KNHC	Tropical Cyclone Discussion (Atlantic)
WTNT71-75 KNHC	Tropical Cyclone Strike Probabilities (Atlantic)
WTPZ 21-25 KNHC	Tropical Cyclone Forecast/Advisory (Eastern Pacific)
WTPZ 31-35 KNHC	Tropical Cyclone Public Advisory (Eastern Pacific)
WTPZ41-45 KNHC	Tropical Cylcone Discussion (Eastern Pacific)
WTPA21-25 PHFO	Tropical Cyclone Forecast/Advisory (Central Pacific)
WTPA31-35 PHFO	Tropical Cyclone Public Advisory (Central Pacific)
WTPA 41-45 PHFO	Tropical Cyclone Discussion (Central Pacific)
WTPQ31-35 PGUM	Tropical Cyclone Public Advisory (Western Pacific)

3.7. Hurricane Liaison Team (HLT).

3.7.1. National Weather Service (NWS) Responsibilities. The NWS supports the HLT through use of Tropical Prediction Center (TPC) meteorologists, Weather Forecast Office (WFO) personnel (typically warning coordination meteorologists and service hydrologists), and River Forecast Center (RFC) hydrologists. Eastern and Southern Region Headquarters will maintain a list of their available HLT candidates.

After HLT deactivation, the Hydrometeorological Prediction Center (HPC) will assume the briefing duties provided the remnants of the tropical cyclone remain a threat to inland areas. TPC and HPC will coordinate prior to the transfer. During the inland event HPC will coordinate with the appropriate WFOs and RFCs and when needed, hydrologists from the RFCs will provide hydrological briefings.

- 3.7.2. Activation. The HLT may be activated when a tropical cyclone in the Atlantic, Gulf of Mexico, Caribbean or eastern Pacific threatens the United States or its territories, and the Director or Deputy Director of TPC deems HLT assistance is required. TPC makes the request for activation by contacting the Federal Emergency Management Agency (FEMA) Operations Center (FOC). Upon FEMA's approval, the FOC will activate the HLT. The TPC Director or Deputy Director will contact the appropriate NWS Regional Director requesting meteorologic and/or hydrologic support. NWS personnel should arrive at TPC within 24 hours. The HLT will remain active until the hurricane threat has passed, at which time HLT operations will be terminated by FEMA.
- 3.7.3. Training. Completing NWS/FEMA's distance learning training module, Community Hurricane Preparedness, is required by HLT members. The module can be taken via the Internet at: http://meted.ucar.edu/hurrican/chp/index.htm. Other training opportunities are strongly encouraged. They are: FEMA's "Introduction to Hurricane Preparedness" conducted at TPC for emergency mangers and NWS personnel, and FEMA's annual HLT training session held at TPC.

3.7.4. *Meteorologic Duties.* The HLT meteorologist will:

- Establish and maintain contact with the impacted WFOs, RFCs, and the HPC.
- Facilitate participation of the impacted NWS offices in conference calls, briefings, and in preparation and distribution of graphics.
- Provide meteorological interpretations on National Hurricane Center advisories (NHC), WFO hurricane local statements, Hurrevac products, and storm surge forecasts for federal, state and local agencies on request.

- Provide storm briefings via video/audio teleconferences for federal, state and local organizations.
- Respond to meteorology-related incoming calls from federal, state, and local emergency managers, and as appropriate, refer meteorologic inquires to the local WFO.

3.7.5. *Hydrologic Duties. The HLT hydrologist will:*

- Establish and maintain contact with the impacted local WFOs, RFCs, and the HPC.
- Facilitate participation of the impacted NWS offices in conference calls, briefings, and in preparation and distribution of graphics.
- Provide hydrologic interpretation on NHC advisories, WFO hurricane local statements, and WFO and RFC hydrologic products for federal, state and local agencies on request.
- Provide technical support for RFC lead during hydrologic portion of video teleconference. In absence of the RFC, lead the hydrologic portion of the video teleconference.
- Respond to hydrology-related incoming calls from federal, state, and local emergency managers and as appropriate, refer hydrologic inquires to the local WFO.